

Section III (Remarks)

Amendment of the Specification

In addition to the amendments in the specification discussed hereafter, the specification has been amended for consistency with the drawings, in paragraphs [0074], [0076], [0082], [0087], [0090], [0095] and [0096]. In addition, the acronym "EMO" in paragraph [0090] has been specifically identified as "Emergency Machine Off" for the corresponding button element.

In paragraph [0095], it has been parenthetically indicated that the manual valve in the line labeled "TO VMB" is not shown in the FIG. 22 drawing, and that the "VMB" acronym stands for Valve Manifold Box.

No new matter (35 U.S.C. § 132) has been added by the amendments to the specification.

Submission of Replacement Sheets of Drawings

Enclosed in Appendix A hereof is a set of replacement sheets of drawings for Figures 1-24B (17 sheets), in replacement for the originally filed informal drawings of the application.

It is requested that the drawings be entered in replacement for the originally filed informal drawings of the application. Consistent with the Examiner's remarks at page 2 of the December 10, 2004 Office Action, each of the replacement sheets of drawings has been so labeled ("Replacement Sheet") in the page header.

Objection to the Drawings Under 37 C.F.R. 1.83 (a)

In the December 10, 2004 Office Action, the Examiner objected to the originally filed drawings of the application as allegedly lacking features specified in the claims. Specifically, the Examiner identified the timer as claimed in claims 8, 12, 13 and 42 and the pumper cabinet as recited in claims 23 and 52 as having to be shown, or such features cancelled from the claims.

In response, it is pointed out that both of these features are in fact shown in appropriate form in the drawings.

In the specification, paragraph [0087] refers to the extractor module 100 of FIG. 19 as including a “main cabinet” and “associated control electronics being housed in a main cabinet 102.” Paragraph [0091] describes the proportional integral derivative (PID) control loop in the programmable logic controller (PLC) of this extractor module, and paragraph [00102] discusses the control circuitry in the electronics compartment of the extractor module (NOTE: the electronics compartment is shown as housing 104 in FIG. 19) as operating to close the pump inlet valve for time interval T2 and switching off the power to the variable frequency drive for the pump for a time interval T3. Paragraph [00105] describes the PID control loop in the electronics circuitry of the extractor module as being programmed to establish the pump inactivation time interval T3, i.e., to provide a timing function, and also notes that alternatively “the time interval T3 can be set by a timer in the auto-switchover system,” i.e., in the electronics circuitry in the electronics enclosure 26 (FIG. 1).

The Examiner's attention is also directed to originally filed FIG. 12, which is reproduced below for ease of reference, as showing a timer in the lower left-hand portion of the screen.

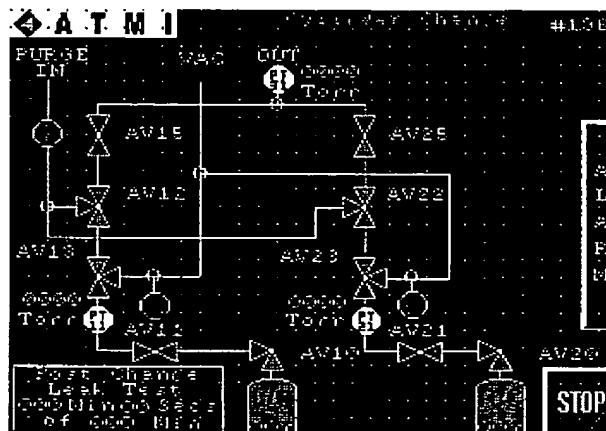


FIG. 12

The timer indicates elapsed time ("000 Min 00 Secs of 000 Min") of the Post Change Leak Test.

See also originally filed FIG. 14, which likewise shows the timer in the lower left-hand portion of the screen.

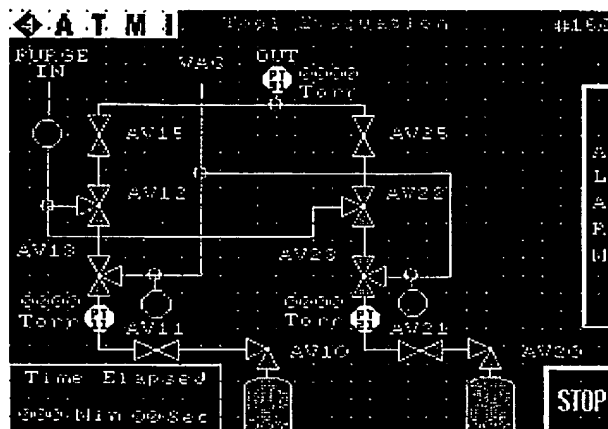


FIG. 14

The timer shows "Time Elapsed" as "000 Min 00 Sec." Similar screens containing timers are shown in FIGS. 15 and 17.

The foregoing clearly provides sufficient basis in the drawings for the recital of a timer in claims 8, 12, 13 and 42.

Concerning the pumper cabinet, such cabinet is clearly shown in FIGS. 19 and 20 of the application, and described in paragraphs [0087] – [0091]. In paragraph [0087], the application states that "[T]he Pump component can also be a constituent of an extractor module 100 as shown in FIG. 19, which may comprise a pump and a surge tank (not shown in FIG. 19; see FIG. 20, described more fully hereinafter). . .[T]he extractor system components may be housed in an exhausted and monitored enclosure, with the gas delivery hardware being housed in a main cabinet 102 equipped with viewing window 108..." (emphasis added).

The extractor module as shown in FIGS. 19 and 20 thus includes pumper cabinet 102. Originally filed FIG. 20 of the application, reproduced below for ease of description, clearly shows the

extractor pump 122 in the cabinet 102 lower portion.

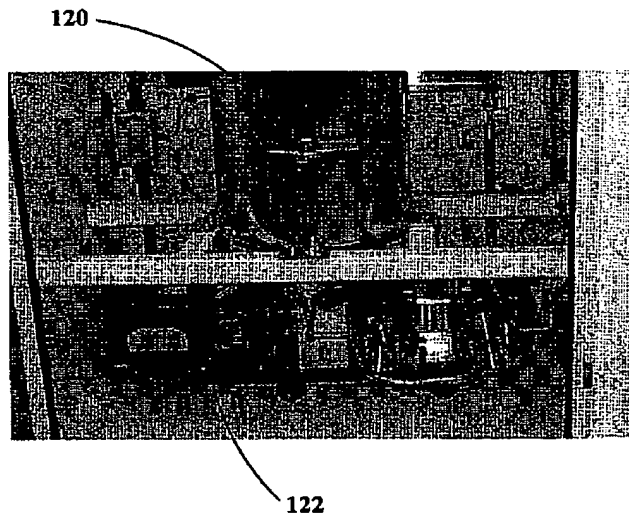


FIG. 20

Consistent with the foregoing, so that all formalistic issues are resolved, the specification has been amended in paragraph [0090] so that the first sentence of such paragraph expressly uses the term “pumper” as used in the originally filed claims 23 and 52:

“[0090] The main cabinet 102 thus constitutes a pumper cabinet that encloses a surge tank 120 and an extractor pump 122, as shown in FIG. 20, process plumbing and the purge and vent plumbing and is monitored for exhaust pressure.”

Based on all of the above, the drawings show the timer of claims 8, 12, 13 and 42, and the pumper cabinet of claims 23 and 52.

The drawings therefore are fully in accord with the requirements of 37 C.F.R. §1.83 (a), thereby overcoming the objection.

Objection to the Specification

In the December 10, 2004 Office Action, the Examiner objected to the specification as failing to

provide proper antecedent basis for subject matter of the claims, specifically (1) rate of change of a characteristic of gas dispensed as recited in claim 6 and 35, (2) means for dynamically setting a time as recited in claims 9 and 38, and (3) pumper cabinet as recited in claims 23 and 52.

Rate of Change of a Characteristic of Gas Dispensed

Considering (1) rate of change of a characteristic of gas dispensed as recited in claims 6 and 35, the Examiner's attention is directed to paragraphs [00100] and [00101] of the specification, as providing clear antecedent basis for recital in the claims of a rate of change of a gas dispensed characteristic.

Paragraph [00100] identifies the characteristic for which rate of change is employed in the auto-switchover sequence as including "specific weight of the vessel approaching its tare weight," "cumulative time of dispensing operation," "diminution of pressure and/or flow rate of the dispensed gas, to a level indicative that the gas by vessel is approaching or at empty status."

Paragraph [00101] identifies corresponding componentry for determining such rate of change, e.g., "a weight sensor, pressure transducer, flowrate sensor, volumetric (cumulative) flow meter, cycled timer, etc."

Means for Dynamically Setting a Time

The (2) means for dynamically setting a time as recited in claims 9 and 38 are discussed in paragraphs [00104] and [00105] of the specification, as including electronic circuitry, the pump inlet valve, pneumatic actuator, pressure transducers, PID control loops and variable frequency drive (VFD) of the pump. Paragraph [00105] specifically refers to establishing the pump inactivation time interval T3 by dynamic programming in the electronic circuitry of the extractor module.

The Pumper Cabinet

The (3) pumper cabinet has been discussed in the section hereinabove entitled "Objection to the Drawings Under 37 C.F.R. 1.83 (a)." As discussed in such section, paragraph [0090] of the specification has been amended so that the first sentence of such paragraph sets forth the term

"pumper cabinet" consistent with recitation in the originally filed claims 23 and 52.

Based on the foregoing, the specification provides proper antecedent basis for the claimed subject matter.

Objection to the Claims

In paragraph 3, at page 3 of the December 10, 2004 Office Action, the Examiner has objected to claims 28, 29 and 58 as reciting "a first vessel" and "a second vessel," suggesting that same should read "first said vessel" and "said second vessel," respectively.

In response to such objection, claims 28, 29 and 58 have been correspondingly amended as requested by the Examiner.

Amendment of Claims 1 and 30

In addition to the above-discussed amendments of the claims, independent system claim 1 and independent claim 30 have been amended herein to recite "in the dispensing operation" in reference to the pump (as being arranged to dispense gas from a gas storage and dispensing vessel in the multi-vessel array), and as identifying the auto-switchover as placing a subsequent on-stream vessel "in the dispensing operation." No new matter (35 USC § 132) has been added.

Rejection of Claims Under 35 U.S.C. §112, and Amendment of Claims to Overcome Such Objections

In paragraph 5 at page 3 of the December 10, 2004 Office Action, the Examiner has rejected claims 27 and 56 under 35 U.S.C. §112, second paragraph, as indefinite ("omnibus type") in failing to point out what is included or excluded by the claim.

In response, claims 27 and 56, each of which as originally filed had recited the system and method as involving "the auto-switchover operational sequence of FIGS. 24A and 24B," are now amended to set out a specifically recited operational sequence. Amended claims 27 and 56 conform with the

requirements of 35 U.S.C §112, second paragraph.

In paragraph 6 at page 3 of the December 10, 2004 Office Action, the Examiner rejected claims 23-27 and 52-56 under 35 U.S.C. §112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter of the invention, based on recital of "pumper cabinet" in claims 23 and 52, as lacking support in the specification (claims 24-27 and 53-56 having been rejected as dependent claims under claims 23 and 52). This issue has been addressed and resolved in the prior sections hereof entitled "Objection to the Drawings Under 37 C.F.R. 1.83 (a)" and "Objection to the Specification." The claims 23-27 and 52-56 are therefore fully in compliance with the requirements of 35 U.S.C. §112, second paragraph.

Rejection of Claims Under 35 U.S.C. §102 and 35 U.S.C. §103

In the December 10, 2004 Office Action, the Examiner has rejected claims 1-58 on reference grounds, including:

a rejection of claims 1, 3, 4, 6, 9-11, 13-19, 21-30, 32, 33, 35, 38-40, 43-48 and 50-58 under 35 U.S.C. §102(b) as anticipated by Dietz U.S. Patent 6,302,139 (hereafter "Dietz");

a rejection of claims 2, 5, 7, 8, 12, 13, 31, 34, 36, 37, 41 and 42 under 35 U.S.C. §103(a) as unpatentable over Dietz; and

a rejection of claims 20 and 49 under 35 U.S.C. §103(a) as unpatentable over Dietz in view of Wang, et al. U.S. Patent 6,101,816 (hereafter "Wang").

These rejections of the claims are traversed and reconsideration of the patentability of the claims is requested, in light of the ensuing remarks.

Patentable Distinction of Claims 1-58 Over the Cited References

As a preface to the ensuing discussion, it is noted that claim 1 has been amended to recite "in the dispensing operation" in reference to the discharge of pumped gas by the recited pump. Further, the same phrase has been inserted in a subsequent passage of the claim, to emphasize the relationship of the pump, auto-switchover and dispensing operation.

The claim 1 system employing a dispensing pump is patentably differentiated from the system disclosed in Dietz, which fails to disclose any such dispensing pump, but instead discloses only an evacuation pump (see FIG. 1 of Dietz, identifying evacuation pump 40). See also column 7, lines 8-14 of Dietz, describing the purge gas manifold line and purge gas discharge line containing evacuation pump 40.

The evacuation pump 40 of Dietz is at no time engaged in the dispensing operation for delivery of product gas. Its only function is to pump waste gas through the scrubber cartridge 42 to exhaust, as shown in FIG. 1 of such patent.

Dietz therefore lacks any teaching or suggestion of "a pump coupled in gas flow communication with the array for pumping of gas derived from an on-stream one of the vessels in the array, and discharge of pumped gas in the dispensing operation," as is required by claim 1, and all claims 2-29 depending directly or indirectly thereunder.

Corresponding distinction is applicable to independent method claim 30, which recites that "the pump is coupled with gas flow communication with the array for pumping of gas derived from an on-stream one of the vessels in the array, and discharge of pumped gas in the dispensing operation." Claim 30 thereby is distinguished from Dietz, as are all method claims 31-58 dependent directly or indirectly from claim 30.

Further, apart from such fundamental difference in structure and operation, Dietz achieves "pressure-smoothing" in the change-over of gas supply vessels in an entirely different and non-analogous manner than is achieved by the claimed system and method of the present invention.

In Dietz, as described at column 8, line 34 to column 9, line 38, one of the gas panels in the system is dispensing and upon approaching empty condition, another gas panel is in preparation for switchover, by purging and evacuation and charging of such second panel with product gas. Purge gas from a purge gas source 34 (see FIG. 1 of Dietz) is flowed through the purge line 32, purge gas manifold line 20 and purge gas discharge line 24 under the action of the evacuation pump 40. Pressure drop in the purging operation is smoothed by use of a restricted flow orifice (RFO-1).

After such purging, the evacuation pump of Dietz operates to evacuate the purge flow circuit. This is the sole extent of use of such pump in Dietz.

Dietz's purge pump thus operates only during the purging step and the purge circuit evacuation step, and is not in any way involved in dispensing operation for pumping of product gas from the system.

Subsequently, in Dietz, the purged and evacuated panel is opened to communication with the main dispensing line, so that product gas is "bled" into the off-stream panel, with a flow regulating device (FR-2) serving to damp any pressure effects.

The off-stream panel is pressure-equalized in this manner, following which the supply valve (valve AV-10) of the cylinder in the off-stream panel is opened, to initiate dispensing operation from such panel.

The evacuation pump in Dietz therefore takes no part in the auto-switchover and is merely provided for withdrawal of purge gas from the purge circuit and for evacuation of the circuit, before the evacuated circuit is filled with product gas from the main delivery line. During such refilling, the evacuation pump is isolated and is not in any way utilized in the manner of the present invention. Claim 1 by contrast requires that "the auto-switchover system after initiating auto-switching reinitiates flow of gas to the pump and reactivates the pump." This is not done in Dietz.

Correspondingly, there is no method step in Dietz of "reinitiating flow of the gas to the pump and reactivating the pump, wherein said reinitiating and reactivating are conducted after the switching step," as required by applicant's broad method claim 30.

Claims 1 and 30 thereby are clearly patentably distinguished from Dietz, as are all claims 2-29 and 31-58 dependent from such independent system and method claims.

It is further noted that system claim 27 and method claim 56 recite specific sequences of system operation and methodology that additionally differentiate from the system and operation of Dietz.

Claim 27 requires an auto-switchover involving actuation of a timer for countdown over a predetermined time interval T1, terminating flow of gas to the dispensing pump for a predetermined time interval T2 and stalling the pump for a predetermined time interval T3, with switch-over occurring after expiration of the time interval T1, dispensing of gas from the second

vessel and at the expiration of T3 flowing gas to the pump, and at expiration of time interval T3 reactivating the pump.

No such operational sequence is taught or in any way suggested in Dietz, and as pointed out hereinabove, Dietz does not utilize or teach any dispensing pump. Dietz instead simply deploys an evacuation pump that does not in any way participate in the switch-over of dispensing vessels.

For all of the foregoing reasons, claims 1-58 are patentably distinguished over Dietz.

The citation of Wang as a secondary reference employed for rejection on § 103(a) grounds of claims 20 and 49 is based on the teaching of Wang to utilize interiorly disposed regulators in gas storage and dispensing vessels. Such usage, even if imported into the Dietz system and method, does not in any way alter the fact that Dietz fails to teach or suggest any dispensing pump, and effectuates auto-switchover in a fundamentally different manner than applicant's claimed invention, in consequence of which Dietz, even if modified by Wang, provides no derivative basis for applicant's claimed system and method.

Based on the foregoing, the examiner is requested to withdraw the rejections of claims 1-58.

CONCLUSION

Based on the foregoing showing of the patentable basis of distinction of claims 1-58 over the cited references, and resolution of the issues involving the drawings and the specification, the application now is in form and condition for allowance.

Issue of a Notice of Allowance is therefore respectfully requested.

If any issues remain outstanding, incident to formal allowance of the application, the Examiner is requested to contact the undersigned attorney at (919) 419-9350 to discuss their resolution, in order that this application may be passed to issue at an early date.

Respectfully submitted,



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